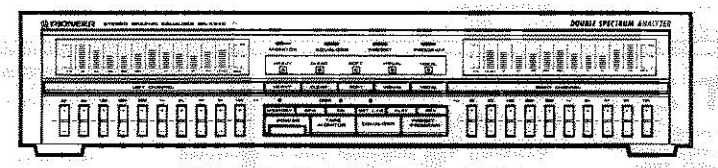
Operating Instructions

GRAPHIC EQUALIZER

GR-X540



Thank you for buying this Pioneer product.
Please read through these operating instructions so you will know how to operate your model properly. After you have finished reading the instructions, put them away in a safe place for future reference.
In some countries or regions, the shape of the power plug and power outlet may sometimes differ from that shown in the explanatory drawings. However, the method of connecting and operating the unit is the same.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

IMPORTANT NOTICE
[For U.S. and Canadian models]

The serial number for this equipment is located on the rear panel. Please write this serial number on your enclosed warranty card and keep it in a secure area. This is for your security.

[For Canadian model]

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

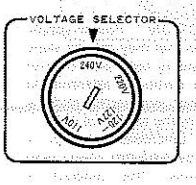
LINE VOLTAGE SELECTOR SWITCH

Only multi-voltage models are provided with this switch. U.S., Canadian, European, U.K., and Australian models are not provided with this switch.

Mains voltages in Saudi Arabia are 127V and 220V only. Never use this model set to 110V in Saudi Arabia.

You will find the line voltage selector switch on the rear panel. Before your model is shipped from the factory, the switch is set to the power requirements of the destination; nevertheless, you should check that it is set properly before plugging the power cord into the AC outlet. If the voltage is not properly set, or if you move to an area where the voltage requirements differ, adjust the selector switch as follows. Before adjusting, disconnect the power cord.

1. Use a medium-size screwdriver.
2. Insert the screwdriver into the groove of the selector switch and turn it so that the power voltage marking of your area points to the arrow.



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PIONEER®
The future of sound and vision.

IMPORTANT 1

The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:
TO PREVENT THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

IMPORTANT 2

If the apparatus is fitted with AC mains power outlet(s), see REAR PANEL FACILITIES for convenient connection of additional Hi-Fi component(s). Make all connections to the AC outlet(s) and the signal terminals first. Connect the plug to the wall socket last, make sure that the power switch is off.

FOR USE IN THE UNITED KINGDOM

WARNING: This plug must only be connected to electronic apparatus equipped with suitable sockets.
If not, cut off the plug and fit an appropriate type in accordance with the instructions below.
The cut-off plug must be disposed of as an electrical shock hazard could exist if connected to a socket outlet.

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured marking identifying the terminals in your plug proceed as follows:
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

SAFETY INSTRUCTIONS

READ INSTRUCTIONS — All the safety and operating instructions should be read before the appliance is operated.

RETAIN INSTRUCTIONS — The operating instructions should be retained for future reference.

HEED WARNING — All warnings on the appliance and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS — All operating and use instructions should be followed.

WATER AND MOISTURE — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

LOCATION — The appliance should be installed in a stable location.

WALL OR CEILING MOUNTING — The appliance should not be mounted to a wall or ceiling.

VENTILATION — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

HEAT — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

POWER SOURCES — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

POWER-CORD PROTECTION — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

POLARIZATION — If your purchased product is provided with a polarized power plug, please read the following instructions. This product is equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

CLEANING — The appliance should be cleaned only with a polishing cloth or a soft dry cloth. Never clean with furniture wax, benzine, insecticides or other volatile liquids since they may corrode the cabinet.

POWER LINES — An outdoor antenna should be located away from power lines.

NONUSE PERIODS — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

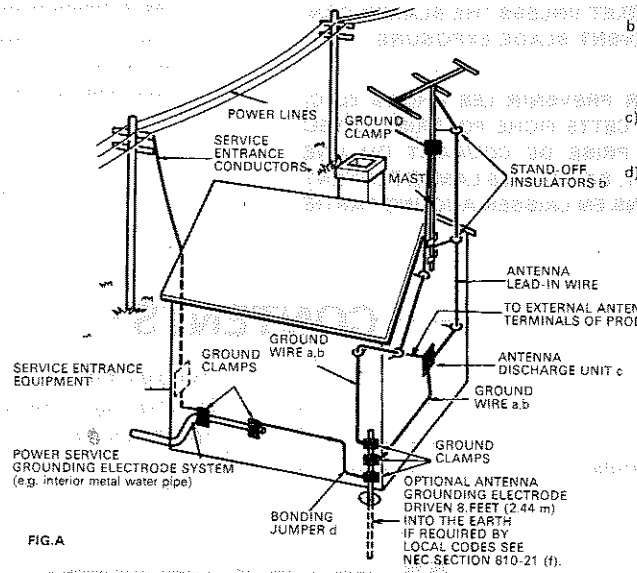
OBJECT AND LIQUID ENTRY — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

DAMAGE REQUIRING SERVICE — The appliance should be serviced by a Pioneer authorized service center or qualified service personnel when:

- The power-supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a marked change in performance; or
- The appliance has been dropped; or the enclosure damaged.

SERVICING — The user should not attempt to service the appliance beyond that described in the operating instructions. For all other servicing, contact the nearest Pioneer authorized service center.

OUTDOOR ANTENNA GROUNDING — If an outside antenna is connected to the antenna terminal, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges.
In the U.S.A. section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Fig. A.


POWER LINES
GROUND CLAMP
SERVICE ENTRANCE CONDUCTORS
MAST
STAND-OFF INSULATORS b
ANTENNA LEAD-IN WIRE
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
GROUND WIRE a,b
GROUND CLAMPS
SERVICE ENTRANCE EQUIPMENT
ANTENNA DISCHARGE UNIT c
GROUND WIRE a,b
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (e.g. interior metal water pipe)
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44 m) INTO THE EARTH IF REQUIRED BY LOCAL CODES SEE NEC SECTION 810-21 (f).
BONDING JUMPER d
FIG.A

a) Use No. 10 AWG (5.3 mm²) copper, No. 8 AWG (8.4 mm²) aluminum, No. 17 AWG (1.0 mm²) coppercad steel, bronze wire, or larger as ground wire.
b) Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4 feet (1.22 meters) to 6 feet (1.83 meters) apart.
c) Mount antenna discharge unit as closely as possible to where lead-in enters house.
d) Use jumper wire not smaller than No.6 AWG (13.3 mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used.
See NEC Section 810-21 (j).

CONNECTIONS

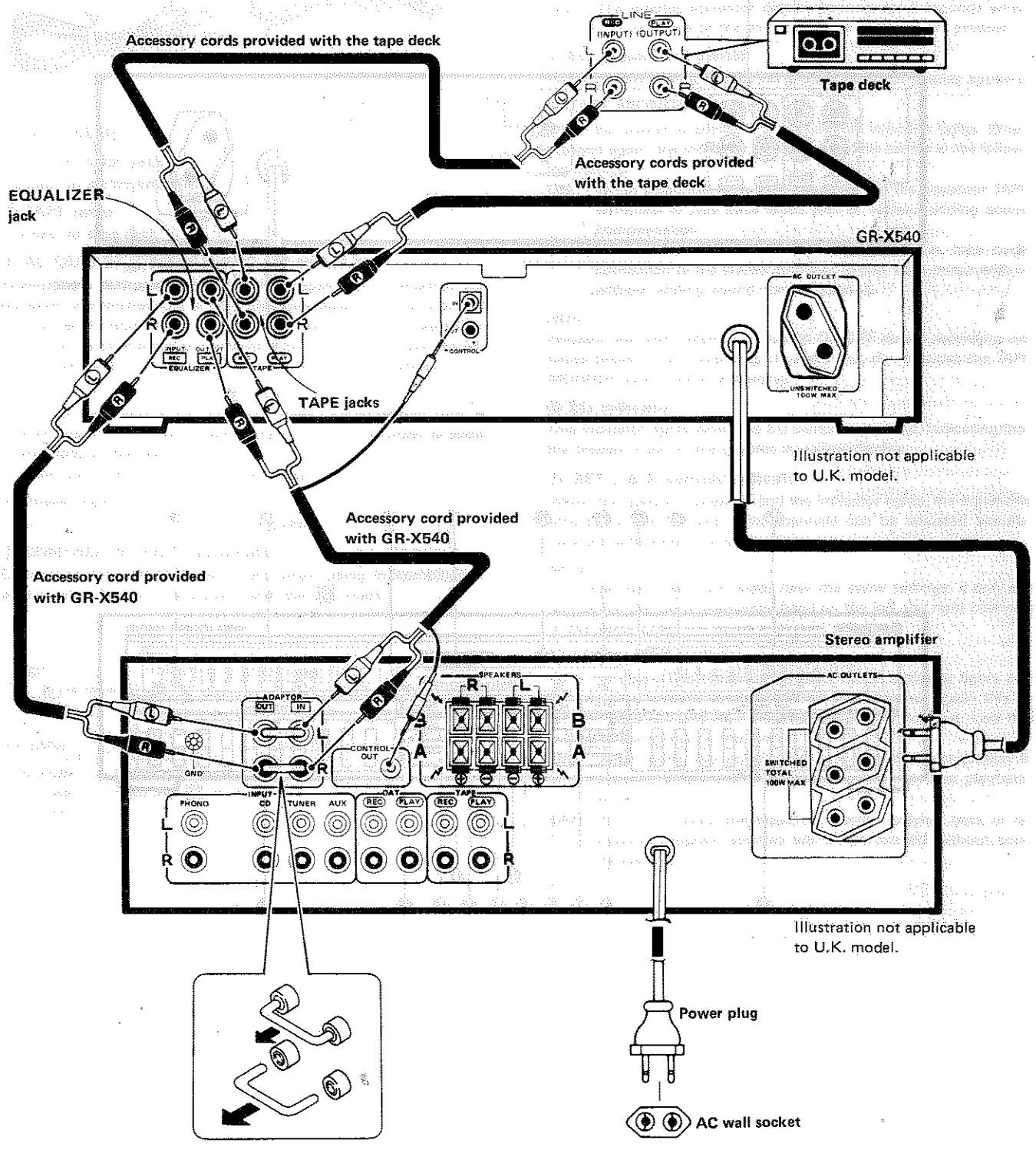
When connecting components, be sure that all power switches are OFF.

STEREO AMPLIFIER ADAPTOR JACKS (Optional A-X540, A-X440, A-X340)

Connect the EQUALIZER INPUT jacks to the stereo amplifier ADAPTOR OUT jacks, and connect EQUALIZER OUTPUT jacks to the stereo amplifier ADAPTOR IN jacks.

This illustration is an example of the connections made when using the GR-X540 in conjunction with PIONEER's components. For details, consult the Operating Instructions of the respective components.

Connect TAPE REC jacks to the tape deck LINE (REC) jacks.
Connect TAPE PLAY jacks to the tape deck LINE (PLAY) jacks.



PANEL FACILITIES

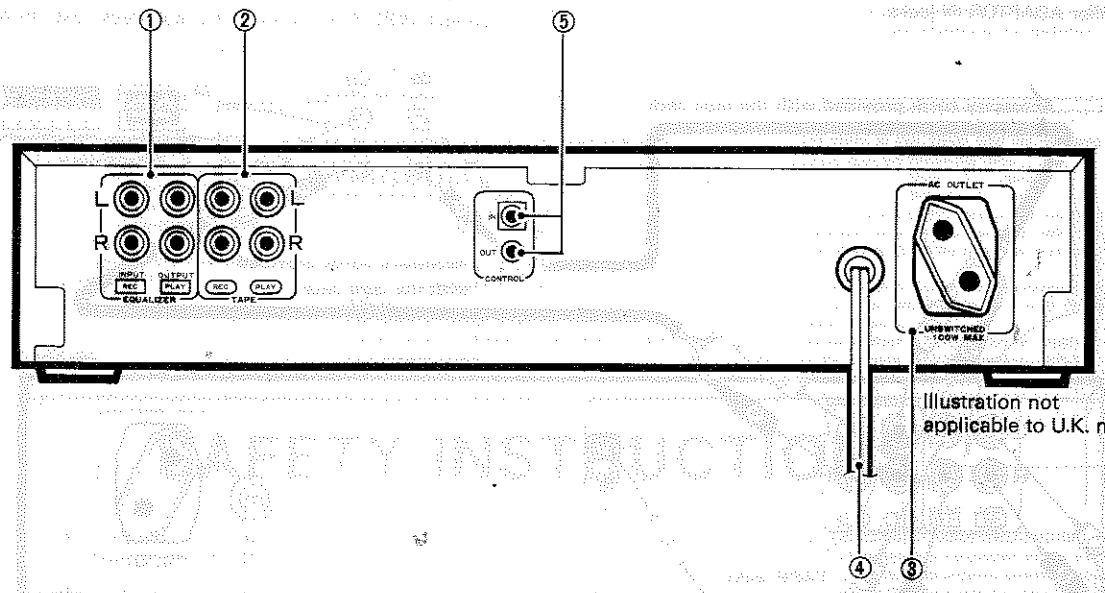
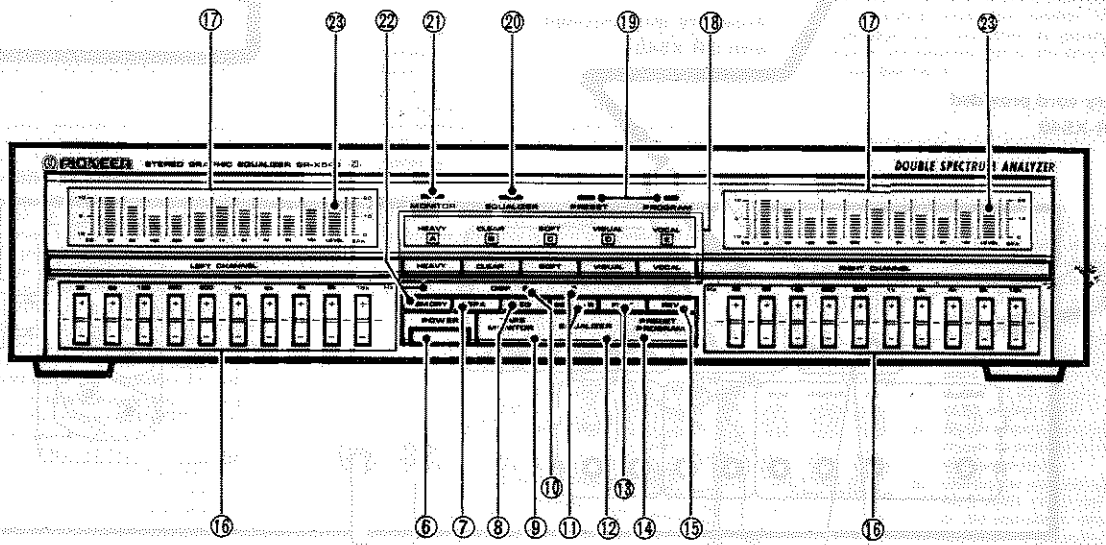


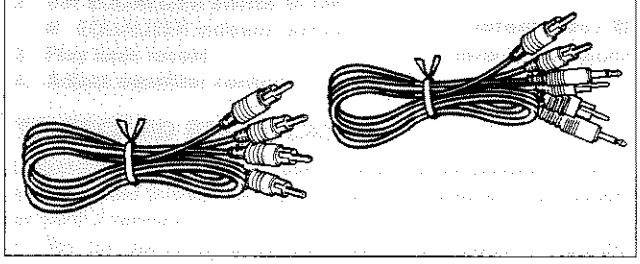
Illustration not applicable to U.K. model.



ACCESSORIES

Pin-plug cords

Pin-plug and Miniplug cords



REAR PANEL

① EQUALIZER jacks

Connect to stereo amplifier.

② TAPE jacks

Connect to tape deck.

③ AC OUTLET (UNSWITCHED 100 W MAX)

Power flows continually to this outlet, regardless of whether the equalizer is switched ON or OFF. Electrical power consumption of the connected equipment should not exceed 100 W. The equalizer should be disconnected by removing the mains plug from the AC wall socket when not in regular use, e.g. when on vacation.

NOTE:

Do not connect appliances with high power consumption such as heaters, irons, or television sets to the AC OUTLET in order to avoid overheating or fire risk.

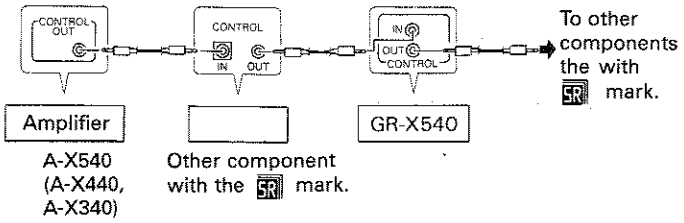
This can cause the equalizer to malfunction.

④ Power cord

Connect to auxiliary AC outlet on amplifier.

⑤ CONTROL IN, OUT terminals

Connect to the CONTROL terminals when using in combination with another Pioneer component with the SR mark.



FRONT PANEL

⑥ POWER switch (ON/OFF)

When this switch is set to the ON position, power is supplied to the unit main circuits (The spectrum analyzer frequency display lights.)

⑦ SPA (spectrum analyzer) switch

When this switch is pressed, the spectrum analyzer display appears. The graphic equalizer display appears for 5 seconds when the control switches or the memory recall switches are pressed.

⑧ EQ (equalizer) switch

When this switch is pressed, the graphic equalizer display appears.

⑨ TAPE MONITOR switch

When this switch is pressed, the MONITOR indicator lights. When pressed again, the indicator goes out. Use this switch in the following manner:

ON: When using the tape deck connected to the equalizer TAPE terminals to play back tapes with or without adding sound compensation.

OFF: When using the components (tuner, turntable, tape deck) connected to the stereo amplifier to play back music with or without adding sound compensations.

NOTE:

Pressing the TAPE MONITOR switch ON/OFF during recording will cause breaks in the recording. To avoid this, do not press the TAPE MONITOR switch while recording.

⑩ EQ indicator

This indicator lights when the EQ switch is pressed, indicating that the display is set to the graphic equalizer display.

⑪ SET L & R switch/indicator

When this switch is pressed and the indicator lights, the equalizing effects for the left and right channels can be adjusted simultaneously with either the left or right channel control switches.

NOTE:

This does not make both sides have the same settings, it only lets you adjust the same frequency band on the left and right channels at the same time.

⑫ EQUALIZER switch

When this switch is pressed, the EQUALIZER indicator lights and its functions become operative. When pressed once again, this indicator goes out and its functions become inoperative. Use this switch in the following manner:

ON: When using the equalizer to add sound compensation to program sources (FM broadcasts, records, tape playback, etc.).

OFF: When not using the equalizer, normal playing back or recording program sources will be performed without compensation.

⑬ FLAT switch
When this switch is pressed, the equalizing effect is made flat (turned off).

⑭ PRESET/PROGRAM switch
Use this switch to select the type of memory to be recalled when using the memory recall switches to recall the equalizing effects set in the memory. The type of memory selected is indicated by the PRESET or PROGRAM indicator.

⑮ REV (Reverse) switch
When this switch is pressed, the set equalizing effect is reversed. (The strengthened frequencies are weakened and the weakened frequencies are strengthened.)

⑯ Control switches
Use these switches to increase (+) or decrease (−) the volume of the indicated frequency.

NOTE:
Tweeters may be damaged if you boost the high frequencies excessively and then play music at high volume. Keep the amplifier volume at a suitable level when using equalization curves that emphasize the treble tones.

⑰ SPECTRUM ANALYZER/EQUALIZER display
For the spectrum analyzer, this display indicates the amplitude of the equalized output signals. For the equalizer, the display indicates the settings of the control switches for the various frequencies.

⑱ Memory recall switches/indicators
These switches are used to recall the preset standard equalizing effects or the equalizing effects stored at memories A through E. When the PRESET indicator is lit, the preset standard equalizing effects can be recalled. There are five preset standard equalizing effects:

HEAVY.....use to add power to the sound
CLEAR.....use to make the sound clearer
SOFT.....use to make the sound softer and less harsh
VISUAL.....use with AV sources (for example, VCR)
VOCAL.....use for music with vocals

When the PROGRAM indicator is lit, the effects stored at memories A through E can be recalled.

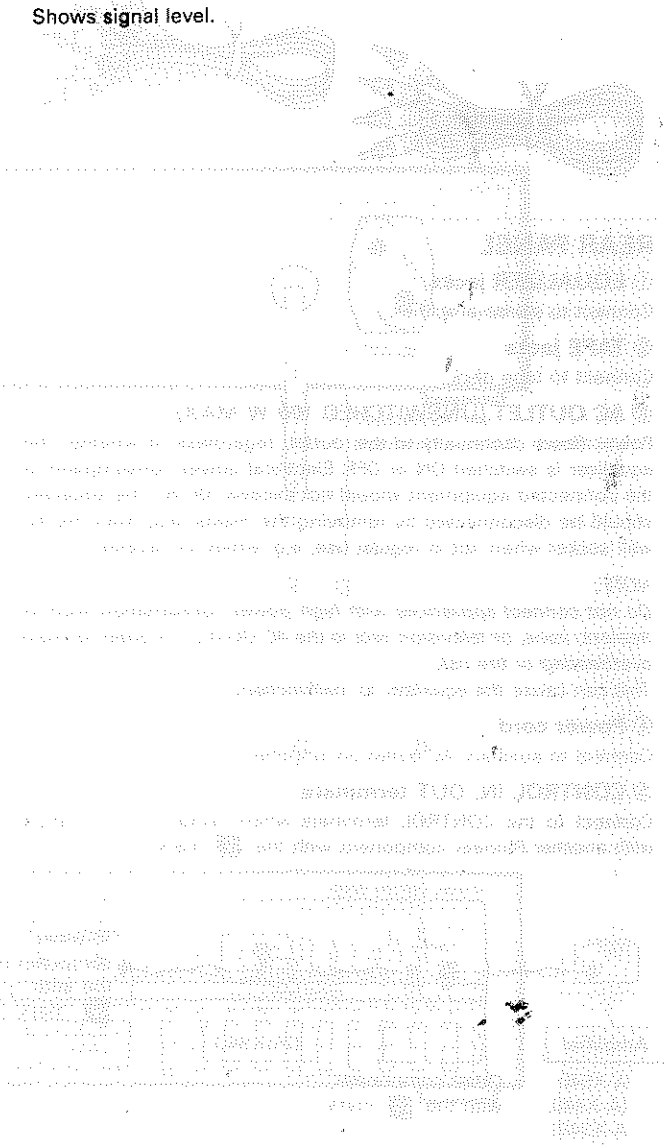
⑲ PRESET and PROGRAM indicators
These indicators indicate the type of memory selected with the memory recall switches.
- When the PRESET indicator is lit — the preset standard equalizing effects are recalled
- When the PROGRAM indicator is lit — the effects stored at switches A through E are recalled

⑳ EQUALIZER indicator
This indicator lights when the EQUALIZER switch is turned on. When lit, the sound adjusted by the equalizer is heard.

㉑ MONITOR indicator
This indicator lights when the TAPE MONITOR switch is turned on. When lit, the sound of the tape deck connected to the TAPE terminals is heard.

㉒ MEMORY switch/indicator
Use this switch to store equalizing effects in the memory. Refer to page 8 for instructions.

㉓ Level meter
Shows signal level.



OPERATION

TO PLAY RECORDS

1. **Set amplifier input selector switch to PHONO.**
2. **Set EQUALIZER switch to ON.**
   - EQUALIZER indicator will turn on.
3. **Play back record.**
4. **Adjust equalizer controls**

TO RECORD BROADCASTS

Depending on the amplifier used, it may not be possible to record sound routed through the GR-X540 when connected to the amplifier TAPE 2 terminal.

- Set the stereo amplifier REC SELECTOR switch to SOURCE when using A-X540.
- Set the stereo amplifier CD DIRECT REC switch to OFF when using A-X440.

1. **Set amplifier input selector switch to TUNER.**
2. **Set EQUALIZER switch to ON.**
   - EQUALIZER indicator will turn on.
3. **Tune in desired station.**
4. **Adjust equalizer controls.**
5. **Record results on tape.**

- When tape deck connected to the GR-X540 or tape deck connected to the stereo amplifier is set to the recording mode, equalizer-compensated broadcasts can be recorded onto a cassette tape.

TO PLAY BACK TAPES

1. **Set amplifier input selector switch to TAPE.**
2. **Set TAPE MONITOR switch as follows:**
   - To play tape deck connected to amplifier .....Set TAPE MONITOR switch to OFF.
   - To play tape deck connected to GR-X540 .....Set TAPE MONITOR switch to ON.
3. **Set EQUALIZER switch to ON.**
4. **Play back tape.**
5. **Adjust equalizer controls.**

TO EDIT TAPES

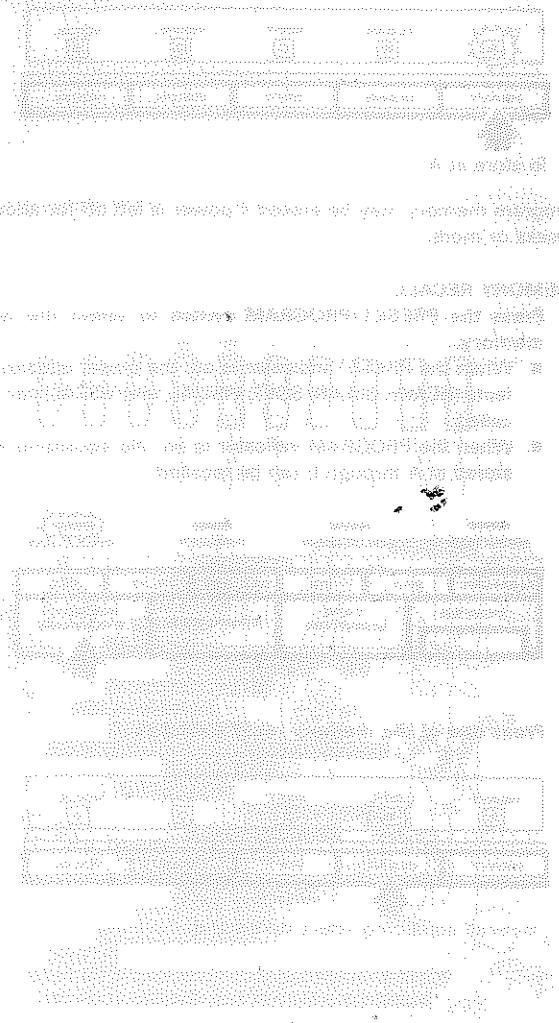
To record the sound of the tape in the deck connected to the amplifier onto the deck connected to the GR-X540:

1. **Set amplifier input selector switch to TAPE.**
2. **Set TAPE MONITOR switch to OFF.**
3. **Set EQUALIZER switch to ON.**
4. **Play back tape in deck connected to amplifier.**
5. **Adjust equalizer controls.**
6. **Begin recording of tape in deck connected to GR-X540.**

To record the sound of the tape in the deck connected to the GR-X540 onto the deck connected to the amplifier:

- Set the stereo amplifier REC SELECTOR switch to SOURCE when using A-X540.
- Set the stereo amplifier CD DIRECT REC switch to OFF when using A-X440.

1. **Set amplifier input selector switch to any position except TAPE.**
2. **Set TAPE MONITOR switch to ON.**
3. **Set EQUALIZER switch to ON.**
4. **Play back tape in deck connected to GR-X540.**
5. **Adjust equalizer controls.**
6. **Begin recording of tape in deck connected to amplifier.**

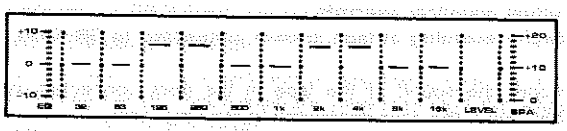


USING THE MEMORY

Five equalizing effects (HEAVY, CLEAR, SOFT, VISUAL, and VOCAL) have been preset in the GR-X540 memory. An addition five other equalizing effects can be set in the memory.

STORING EQUALIZING EFFECTS IN THE MEMORY

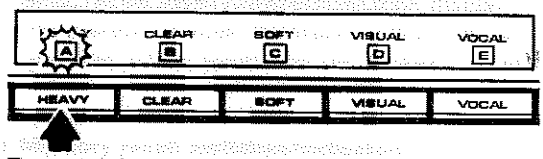
1. Set the equalizing effect.



2. Press the MEMORY switch.

The indicator will flash for about five seconds.

3. Press one of the memory recall switches (A through E) before the indicator stops flashing.



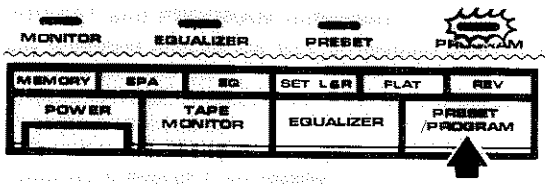
To store at A

Program memory may be erased if power is left off for about two weeks or more.

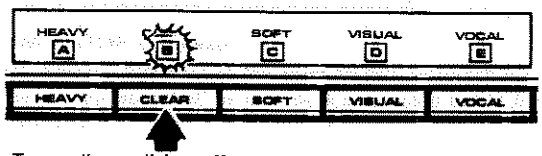
MEMORY RECALL

1. Press the PRESET/PROGRAM switch to select the type of memory.

- When the PRESET indicator is on, the preset equalizing effects (HEAVY, CLEAR, SOFT, VISUAL, and VOCAL) can be recalled.
- When the PROGRAM indicator is on, the equalizing effects stored at A through E can be recalled.



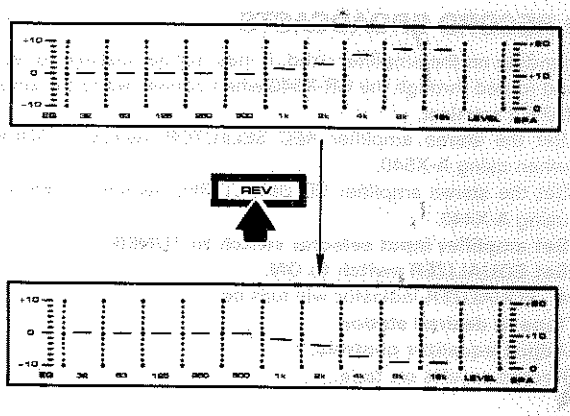
2. Press one of the memory recall switches.



To recall equalizing effect stored at B

USING THE REVERSE SWITCH

This function makes it possible to automatically create the opposite of the equalizing effect shown on the display. When playing a tape recorded with an equalizing effect, the original sound can be obtained by recalling the setting used when the tape was recorded then pressing the REV switch to reverse the effect.



USING THE EQUALIZER CONTROLS

The graphic equalizer divides the music source into a number of frequency bands and boosts or attenuates the level at each of the frequencies, enabling much finer sound quality adjustments than ordinary tone controls and sound field compensation.
Some examples of operation are given below.

1 COMPENSATING FOR THE PLAYBACK FREQUENCY RESPONSE

The frequency response of a phono-cartridge or speaker has peaks and dips in the high range and low range. It can be made flat by adjusting finely the controls on the graphic equalizer.

2 IMPROVING THE ACOUSTICS OF THE LISTENING ROOM

The ideal listening room is one where the transmission frequency response is flat. In actual fact, however, the acoustics vary depending on the effects of the structure of the room and its furniture, and on the listening position.

Although there is minimal treble attenuation in a listening room surrounded by hard walls and windows and having a bare floor, the bass sounds are reflected to a great extent.
In rooms like these, turn up the 125 Hz control slightly.
In a room surrounded by drapes and with carpets on the floor, there is minimal reflection of the sound and both the bass and the treble and absorbed.
In rooms like these, turn up the 63 Hz control slightly and turn up the frequency controls above 2 kHz gradually.
The above examples are extremely general.
The acoustics undergo change in accordance with the furniture in the listening room, the height of the ceiling and the listening position, among other factors. Play the music and try operating each of the controls to produce the best effect.

3 COLORING THE REPRODUCED SOUND

All instruments and vocals have their own frequency band, as shown in the figure.
By moving the controls up or down, the volume of the instruments preferred can be boosted or other instruments can be attenuated. For instance, it is possible to boost the 63 Hz frequency and give the bass drum a greater "punch" or boost the 1 kHz frequency and position the vocals at the front. When the 8 kHz frequency is boosted, the cymbals and "high hat" sound much clearer.
Instruments and vocals have a great many harmonic components along with the fundamental frequency hand and so you can have lots of fun operating the 10 controls to achieve the sound of your choice.

NOTE:
In order to protect the speakers from damage resulting from power overload, do not excessively increase the stereo amplifier volume level when boosting the treble range on this unit.

① Cymbals ② Soprano ③ Alto ④ Tenor ⑤ Baritone
⑥ Bass ⑦ Violin ⑧ Cello ⑨ Contrabass ⑩ Guitar
⑪ Piano ⑫ Trumpet ⑬ Trombone ⑭ Piccolo
⑮ Flute ⑯ Alto clarinet ⑰ Tener saxophone ⑱ Oboe
⑲ English horn ⑳ Basoon
㉑ Bass drum ㉒ Pipe organ ㉓ Electric organ

4 RECORDING TECHNIQUES USING THE GRAPHIC EQUALIZER

Coloring the sound of vocals or instruments

The sound of vocals and instruments can be colored at will by operating the controls. For instance, when the 500 Hz, 1 kHz and 2 kHz controls are raised and the other controls lowered, people's voices sound as if heard on a telephone.

Preventing howl during play

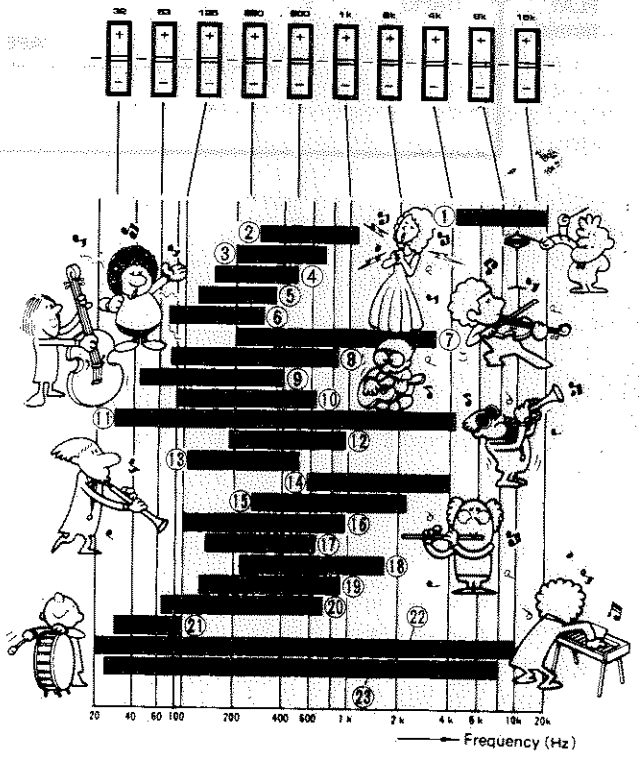
Any irritating howl during play can be prevented by lowering the knob corresponding to the frequency band in which the howl occurs.

Noise can be reduced during recording and playback

When the high-range controls are boosted in step fashion during recording and then lowered in reverse fashion during playback, tape hiss and other high-range noise can be reduced.

Creating recorded tapes most compatible with the playback equipment

A sound with a greater "punch" can be recorded for playback on car stereo equipment if the ultra-low-range, which is hard to hear, is cut out and the mid-range is boosted.

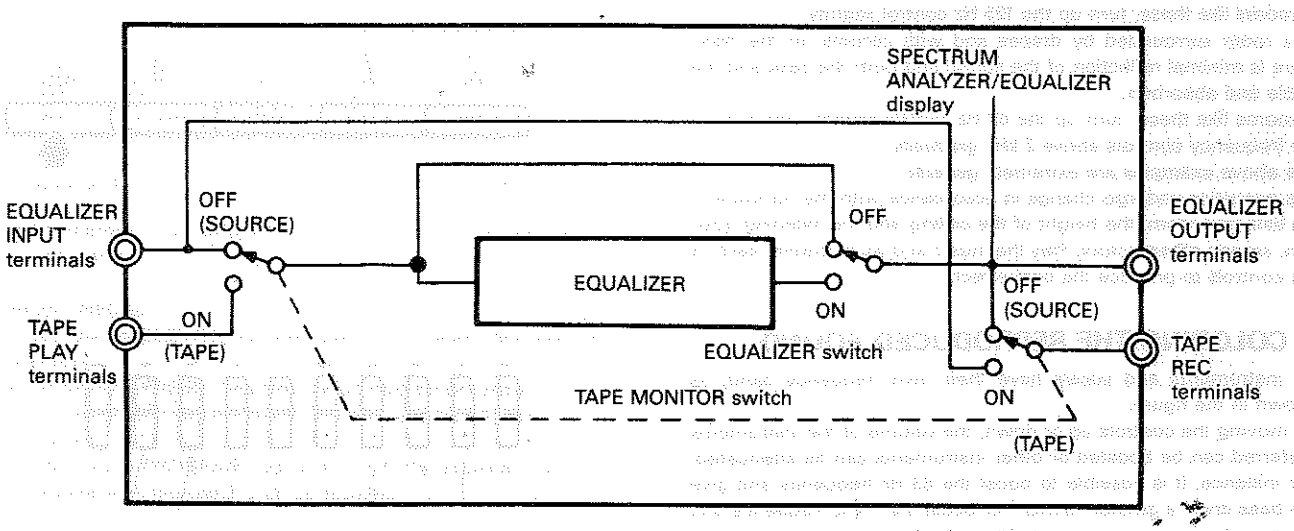


TROUBLESHOOTING

Incorrect operations are often mistaken for trouble and malfunctions. If you think that there is something wrong with this component, check the points below. Sometimes the trouble may lie in another component. Investigate the other components and electrical appliances being used. If the trouble cannot be rectified even after exercising the checks listed below, ask your nearest PIONEER authorized service center or your dealer to carry out repair work.

SYMPTOM	CAUSE	REMEDY
No sound.	• Power switch is OFF. • Power cord is not connected. • TAPE MONITOR switch is ON. • Incorrect operation of stereo amplifier. • Connecting cords are disconnected.	• Turn power switch on. • Plug in power cord. • Set TAPE MONITOR switch to OFF. • Check the settings of the amplifier switches. (consult the amplifier operating instructions.) • Connect the cords properly.
No graphic equalizer effects.	• EQUALIZER switch is set to OFF.	• Set to ON.

FUNCTIONING OF SWITCHES



Above diagram shows L channel only.

SPECIFICATIONS

Input terminals (reference input level/input impedance)
INPUT, TAPE PLAY ..... 150 mV/50 kΩ
Gain ..... 0 dB
Output terminals
(reference output level/output impedance)
OUTPUT ..... 150 mV/2.2 kΩ
REC OUT ..... 150 mV
Harmonic distortion (20 Hz ~ 20 kHz, output 1V)
..... 0.02%
Frequency response
INPUT, TAPE PLAY ..... 5 Hz ~ 70 kHz $^{0}_{-3}$ dB
Equalizer bands
Center frequencies
..... 32 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz
Variable range ..... ± 10 dB
SN ratio (IHF, A network, short circuit, 1 V)
INPUT, TAPE PLAY ..... 110 dB
SN ratio (DIN)
INPUT, TAPE PLAY ..... 90 dB
Spectrum analyzer
Center Frequencies
..... 32 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, Total

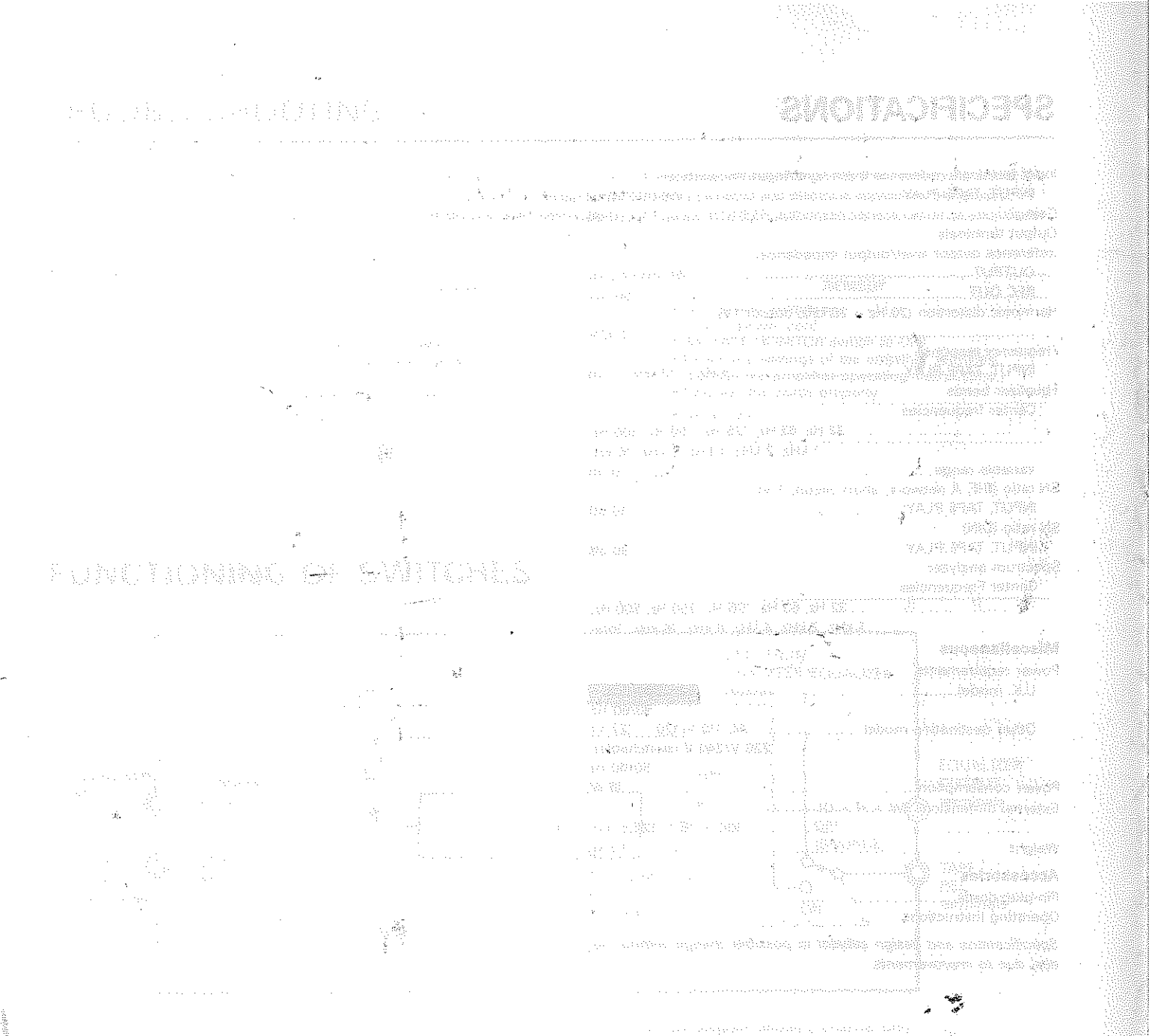
Miscellaneous

Power requirements
U.K. model ..... a.c 240 Volts ~ 50/60 Hz
Other destination model ..... AC 110 V/120 — 127 V/220 V/240 V (switchable), 50/60 Hz
Power consumption ..... 18 W
External dimensions (W × H × D)
..... 360 × 75 × 326.5 mm
Weight ..... 3.5 kg

Accessories

Pin-plug cords 2
Operating Instructions 1

Specifications and design subject to possible change without notice, due to improvements.



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